

Chemistry I: Redox Equations:

Rules for balancing REDOX equations by half-cell method.

1. Assign oxidation numbers to each individual element.
2. Determine which elements change in charge from one side of the equation to the other. Write them below the equation.
3. Determine how many electrons are lost and gained by each element that changes. These are called half-cells.
4. Use coefficients to balance the number of electrons gained and lost. The number of electrons lost by one element MUST equal the number of electrons gained by another element.
5. Use coefficients obtained in the half-cell reactions to balance those elements in the complete equation.
6. Balance ALL other elements except oxygen and hydrogen.
7. Balance hydrogen.
8. Balance oxygen.

Hints for identifying the elements that change in a redox reaction.

1. An element is a free element on one side of the equation and combined on the other.
2. Transition metals are involved in the reaction
3. An element changes position
 - a. $\text{KMnO}_4 \rightarrow \text{MnO}_2$
 - b. $\text{KClO}_3 \rightarrow \text{KCl}$
4. also sulfates and sulfites can change
 - a. $\text{SO}_4^{-2} \rightarrow \text{SO}_3^{-2}$